

## REMARKS

Claim 1 has been amended to recite that the xylanase is added in an amount effective for increasing the shelf-life of the dough-based product prepared from the dough. Claim 6 has been amended to recite the species name. Support for the amendments appears throughout the specification as filed, e.g., page 1, lines 13-16 and page 2, lines 8-12, the Examples and the original claims.

It is respectfully submitted that the present amendment presents no new issues or new matter and places this case in condition for allowance. Reconsideration of the application in view of the above amendments and the following remarks is requested.

### I. Claim Objection

Claim 6 is objected to for not reciting the species name. The objection is respectfully traversed.

Claim 6 has been amended to recite the species name, thereby obviating the objection.

For the foregoing reasons, Applicants submit that the claims overcome the objection. Applicants respectfully request reconsideration and withdrawal of the objection.

### II. The Rejection of Claims 1-20 under 35 U.S.C. 103

Claims 1-20 remain rejected under 35 U.S.C. 103 as allegedly obvious over Sibbesen et al., WO 03/020923 ("R1") in view of Cherry et al. US 2003/009902 ("R2") and Watanabe et al., "Cloning, Expression and Cell Surface Localization of *Paenibacillus* sp.," Appl. Environ. Microbiol. 69(12) 6969-6978 (2003) ("R3"). The Examiner states that R1 discloses a variant xylanase polypeptide or fragment thereof having xylanase activity, and states that xylanases of family 11 are of interest in baking. The Examiner states that R1 is silent on the addition of exo-acting maltogenic amylase to dough, and to the *Paenibacillus* xylanase as presently claimed. The Examiner states that R2 discloses maltogenic alpha amylase variants for retarding staling or preventing retrogradation in the baking industry, and the combination of maltogenic enzyme with additional enzymes including xylanase. The Examiner states that R2 is also silent as to the claimed *Paenibacillus* xylanase. The Examiner states that R3 discloses cloning and expression of *Paenibacillus* xylanase as evidence that xylanase from *Paenibacillus* was known in the art, and states that screening for a specific *Paenibacillus* sp. for xylanase activity would have been obvious and within skill in the art. The Examiner states that it would have been obvious to one of skill in the art to prepare xylanase from any source, including the claimed species, and clone it in host

cells and culture hosts and recover enzymes to apply in baking. The Examiner also concludes that since the claimed xylanase was known, its incorporation into dough would have produced the same results as the presently claimed xylanase regarding the freshness of the bread crumb.

The Examiner also states that Applicants' prior arguments have been considered but are not persuasive to overcome the rejection. With regard to the comparative data of Example 3, the Examiner states that the feature of increasing the amount of free water is not a claimed feature but nevertheless the incorporation of the xylanase of the invention still would have been obvious in view of R1.

This rejection is respectfully traversed.

Obviousness is a question of law based on underlying findings of fact. An analysis of obviousness must be based on several factual inquiries: (1) the scope and content of the prior art; (2) the differences between the prior art and the claims at issue; (3) the level of ordinary skill in the art at the time the invention was made; and (4) objective evidence of nonobviousness, if any. *Graham v. John Deere Co.*, 148 USPQ 459, 467 (1966). The teachings of a prior art reference are underlying factual questions in the obviousness inquiry. *Para-Ordnance Mfg., Inc. v. SGS Imp. Int'l, Inc.*, 37 USPQ2d 1237, 1240 (Fed. Cir. 1995). "[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *KSR Int'l Co. v. Teleflex Inc.*, 82 USPQ2d 1385, 1396 quoting *In re Kahn*, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006).

The amended claims are directed to processes for preparing a dough-based product, comprising adding a xylanase to a dough, leavening, and heating the dough, wherein the xylanase is a polypeptide having at least 90% identity to the amino acid sequence as shown in positions 1-182 of SEQ ID NO: 2 or encoded by a nucleic acid sequence which hybridizes at 38°C in 0.1 x SSC with the complementary strand of nucleotides 85-630 of SEQ ID NO: 1, and wherein the xylanase is added in an amount effective for increasing the shelf-life of the dough-based product prepared from the dough.

The Examiner alleges essentially that it would have been obvious to one of skill in the art to prepare xylanase from any source, including the claimed species, and clone it in host cells and culture hosts and recover enzymes to apply in baking. However, the Examiner has provided no articulated reasoning with some rational underpinning as to why it would allegedly have been obvious to one of ordinary skill in the art to do so with the *particular* xylanase according to Applicants' claims, i.e., where the xylanase is a polypeptide having at least 90% identity to the

amino acid sequence as shown in positions 1-182 of SEQ ID NO: 2 or encoded by a nucleic acid sequence which hybridizes at 38°C in 0.1 x SSC with the complementary strand of nucleotides 85-630 of SEQ ID NO: 1. Accordingly, the Examiner has not met his burden in establishing a *prima facie* case of obviousness.

Moreover, the presently claimed processes, as amended, require that the xylanase is added in an amount effective for increasing the shelf-life of the dough-based product prepared from the dough.

It is respectfully submitted that none of R1, R2 and/or R3 teach or suggest the use of an xylanase in preparing dough based products, in a flour composition or in a granulate, wherein the xylanase has at least 90% identity to SEQ ID NO:2 or is encoded by a polynucleotide that hybridizes to SEQ ID NO:1, let alone in an amount for increasing the shelf-life of the dough-based product prepared from the dough.

Furthermore, applicants respectfully submit that the specification as filed demonstrates an improvement of the claimed invention over the prior art. For instance, Example 3 shows that the xylanase of the invention increases the amount of free water, which has been described in the literature to correlate to moistness of bread crumb, more than prior art xylanase. Moreover, Example 3 shows that the bread crumb made with xylanase of the invention together with a maltogenic alpha-amylase was perceived as more moist than bread made with the prior art xylanase and maltogenic alpha-amylase. The ranking of the sensory evaluation of softness and moistness on day 21 showed that bread crumb made with the xylanase of the invention together with Novamyl was perceived as more moist than bread made with prior-art xylanase and Novamyl.

The claimed processes require that the xylanase is added in an amount for increasing the shelf-life of the dough-based product prepared from the dough, which is also demonstrated by the present Examples. Example 3 further shows that the xylanase useful according to the invention shows improvements in both firmness and elasticity after 7 days, 14 days and 21 days. These results demonstrate that the xylanase of the invention together with Novamyl outperforms the combination of the prior-art xylanase and Novamyl.

Thus, Example 3 demonstrates the xylanase of the invention is effective in increasing the shelf-life of the dough-based product prepared from the dough, as demonstrated, e.g., by the results at day 21, and as required by the claims.

For the foregoing reasons, Applicants submit that the claims overcome this rejection under 35 U.S.C. 103. Applicants respectfully request reconsideration and withdrawal of the rejection.

### III. Conclusion

In view of the above, it is respectfully submitted that all claims are in condition for allowance. Early action to that end is respectfully requested. The Examiner is hereby invited to contact the undersigned by telephone if there are any questions concerning this amendment or application.

All required fees were charged to Novozymes North America, Inc.'s Deposit Account No. 50-1701 at the time of electronic filing. The USPTO is authorized to charge this Deposit Account should any additional fees be due.

Respectfully submitted,

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